

8       links, wherein each node of the N linked nodes is a  
9       computer-readable document containing information;  
10      (b) computing an approximation  $\mathbf{p}_n$  to a steady-state probability  
11       $\mathbf{p}_\infty$ , wherein each component of  $\mathbf{p}_\infty$  represents a probability  
12      that the user will randomly end up a given node after a  
13      large number of forward links, in accordance with the  
14      equation  $\mathbf{p}_n = \mathbf{A}^n \mathbf{p}_0$ , where  $\mathbf{A}$  is an NxN transition  
15      probability matrix having elements  $\mathbf{A}[i][j]$  representing a  
16      probability of moving from node i to node j; and  
17      (c) determining a rank  $r[k]$  for a node k from a  $k^{\text{th}}$  component of  
18       $\mathbf{p}_n$ , wherein  $r[k]$  represents an importance of the  
19      information contained in node k.

20

1       8. (AMENDED) A computer implemented method for assigning a  
2       rank to N nodes of a linked database stored in a computer-  
3       readable medium, wherein each node contains computer-readable  
4       information, the method comprising calculating for a node, a  
5       weighted sum of ranks of backlink nodes to the node, wherein  
6       each of the backlink nodes is weighted in dependence upon the  
7       total number of links in the backlink node, wherein the rank  
8       assigned to a given node represents an importance to a user  
9       of the information contained in the node.

- 10
- 1       Kindly add the following new claims:

1       --9. (NEW) A computer implemented method for calculating an  
2 importance rank for each of N linked web page documents, the  
3 method comprising the steps of:  
4  
5       (a) selecting an initial N-dimensional vector  $\mathbf{p}_0$  wherein each  
6 component of  $\mathbf{p}_0$  represents an initial estimate of a  
7 probability that a user arrive at a given web page document  
8 after a large number of forward links;  
9       (b) computing an approximation  $\mathbf{p}_n$  to a steady-state probability  
10       $\mathbf{p}_\infty$ , wherein each component of  $\mathbf{p}_\infty$  represents an improved  
11      estimate of a probability that the user will randomly at a  
12      given web page document, in accordance with the equation  $\mathbf{p}_n$   
13       $= \mathbf{A}^n \mathbf{p}_0$ , where  $\mathbf{A}$  is an NxN transition probability matrix  
14      having elements  $\mathbf{A}[i][j]$  representing a probability of  
15      moving from web page document i to web page document j, and  
16       (c) determining a rank  $r[k]$  for a web page document k from a  $k^{th}$   
17      component of  $\mathbf{p}_n$ , wherein  $r[k]$  represents an importance of  
18      the information contained in a particular web page document  
19      k.

1       10. (NEW) The method of claim 9 wherein the matrix  $\mathbf{A}$  is chosen  
2 so that an importance rank of a given web page document is  
3 calculated, in part, from a weighted sum of importance  
4 ranks of web page documents backlinked to the given web  
5 page document.

1 11. (NEW) The method of claim 10 wherein the importance ranks  
2 of each of the backlinked web page documents is weighted in  
3 dependence upon the total number of links in the backlinked  
4 web page document.

1 12. (NEW) The method of claim 9 wherein the matrix **A** is chosen  
2 so that an importance rank of a web page document is  
3 calculated, in part, from a constant  $\alpha$  representing the  
4 probability that a surfer will randomly jump to the web  
5 page document.

*A3*  
*cont.* 1 13. (NEW) The method of claim 9 wherein the matrix **A** is chosen  
2 so that an importance rank of a web page document is  
3 calculated, in part, from a measure of distances between  
4 the web page document and backlink nodes of the web page  
5 document.

1 14. (NEW) The method of claim 9 wherein the initial N-  
2 dimensional vector  $p_0$  is selected to represent a uniform  
3 probability distribution.

1 15. (NEW) The method of claim 9 wherein the initial N-  
2 dimensional vector  $p_0$  is selected to represent a non-  
3 uniform probability distribution, wherein a predetermined  
4 set of web page documents is given a relatively large  
5 initial probability.

1 16. (NEW) A computer implemented method of ranking a  
2 plurality of linked documents, comprising:

3 obtaining a plurality of linked documents;  
4 for each linked document pointed to by a link in one or  
5 more of the plurality of linked documents, assigning a rank  
6 to the linked document that is dependent on ranks of the one  
7 or more of the plurality of linked documents; and  
8 processing the linked documents according to their rank.

*a3*  
cont.  
1 17. (NEW) The method of claim 16, wherein the rank  
2 assigned to the linked document is dependent on the sum of the  
3 ranks of the one or more of the plurality of linked documents.

*Jab*  
1 18. (NEW) The method of claim 16, wherein each of the  
2 ranks of the one or more of the plurality of linked documents  
3 are adjusted by a weight.

*bwbDz*  
1 19. (NEW) The method of claim 18, wherein the weight is  
2 dependent on the number of links in the one or more of the  
3 plurality of linked documents.

1 20. (NEW) The method of claim 18, wherein the weight is  
2 dependent on an estimation of a probability that a linked  
3 document will be accessed.

1 21. (NEW) The method of claim 18, wherein the weight is  
2 dependent on the URL, host, domain, author, institution, or

3 last update time of the one or more plurality of linked  
4 documents.

1 22. (NEW) The method of claim 18, wherein the weight is  
2 dependent on whether the one or more plurality of linked  
3 documents are selected documents or roots.

1 23. (NEW) The method of claim 18, wherein the weight is  
2 dependent on the importance, visibility or textual emphasis of  
3 the links in the one or more of the plurality of linked  
4 documents.  
*A3  
cont.*

1 24. (NEW) The method of claim 18, wherein the weight is  
2 dependent on a particular user's preferences, the rate at which  
3 users access the one or more plurality of linked documents, or  
4 the importance of the one or more plurality of linked documents.

*b1b2b3* 25. (NEW) The method of claim 16, wherein the processing  
2 includes displaying links to the linked documents as results  
3 from a search.

1 26. (NEW) The method of claim 16, wherein the processing  
2 includes crawling the linked documents.

1 27. (NEW) The method of claim 16, wherein the processing  
2 includes displaying links to the linked documents as a directory  
3 listing.

1           28. (NEW) The method of claim 16, further comprising:  
2           generating an initial estimate of the rank of each of the  
3           one or more plurality of linked documents; and  
4           updating the estimate of the rank for each of the one or  
5           more plurality of linked documents utilizing estimates of ranks  
6           for linked documents that include a link to the linked document.

1           29. (NEW) The method of claim 16, wherein the processing  
2           includes displaying links to the linked documents and  
3           annotations representing the relative importance or rank of each  
4           of the linked documents.

1           30. (NEW) The method of claim 29, wherein the annotations  
2           are bars, icons or text.

1           31. (NEW) The method of claim 16, wherein the linked  
2           documents are also processed according to textual matching.

1           32. (NEW) The method of claim 31, wherein the textual  
2           matching includes anchor text associated with the links.

1           33. (NEW) The method of claim 16, wherein the linked  
2           documents are also processed according to groupings of the  
3           linked documents.

1           34. (NEW) A computer implemented method of ranking a  
2 plurality of linked documents, comprising:  
3                 performing a random traversal of a plurality of linked  
4 documents;  
5                 for each linked document that is traversed, assigning a  
6 rank to the linked document that is dependent on the number of  
7 times the linked document has been traversed; and  
8                 processing the plurality of linked documents according to  
9 their rank.

1           35. (NEW) The method of claim 34, wherein the rank is also  
2 dependent on the number of linked documents that have been  
3 traversed.

1           36. (NEW) The method of claim 34, wherein performing a  
2 random traversal includes selecting a random link according to a  
3 distribution to traverse in a current linked document.

1           37. (NEW) The method of claim 36, wherein there is a  
2 predetermined probability that the next linked document  
3 to be traversed will be a random one according to a  
4 distribution of the plurality of linked documents.--